

# Quarterly Reports

FY 2020 Second Quarter

Latest Reports and Study Profiles Posted to the  
Environmental Studies Program Information System (ESPIS)





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The Environmental Studies Program (ESP) Quarterly Reports include summaries of the Bureau of Ocean Energy Management (BOEM) environmental studies completed each quarter. These studies inform BOEM’s policy decisions on the development of energy and mineral resources on the Outer Continental Shelf (OCS).

Visit ESPIS at <https://marinecadastre.gov/espis/#/>

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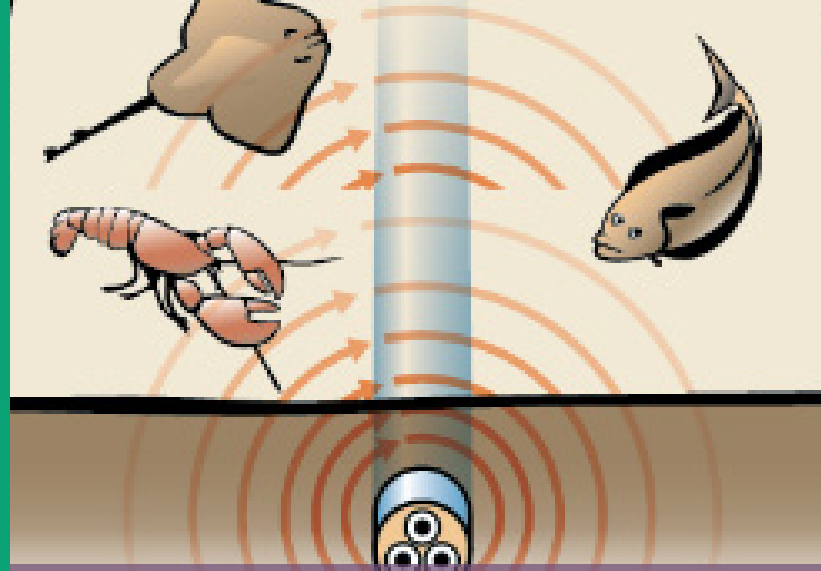
# Evaluation of Potential EMF Effects on Fish Species of Commercial or Recreational Fishing Importance in Southern New England

**ESPIS Link:** <https://marinecadastre.gov/espis/#/search/study/100263>

**Conducted by:** CSA Ocean Sciences Inc.

**National Studies List:** AT-19-05

**Study Products (available in ESPIS):** Final report



*Exposure of fish to EMF varies with their preferred space in the water column*

## Purpose/Information Use:

The development of offshore wind technology along the Atlantic Coast of the United States has raised public concern about the potential effects of electric and magnetic fields (EMF) from undersea power cables on commercially and recreationally important fish species. This study summarizes what is currently known about EMF issues, addresses common concerns and misconceptions, and provides background information about EMF in the environment and the relevance of EMF to fish species of concern in the Southern New England area. The results of the study will help BOEM better evaluate potential environmental impacts of offshore wind development.

## Findings/Results:

- Undersea power cables associated with offshore wind energy projects within the southern New England area will generate weak EMF at frequencies outside the known range of detection by electrosensitive and magnetosensitive fishes.
- Most fishery species in the Southern New England area are bony fishes, which have not evolved to detect EMF at 60 Hz (the frequency used by underwater power cables).
- Skates are the species with the greatest potential for exposure to EMF from undersea power cables; however, EMF decays very quickly with distance from the cable, which minimizes potential exposure.
- Review of the evidence to date does not indicate that EMF from undersea power cables negatively affects commercially and recreationally important fish species within the Southern New England area.

## Final Reports:

Snyder DB, Bailey WH, Palmquist K, Cotts BRT, Olsen KR. 2019. Evaluation of potential EMF effects on fish species of commercial or recreational fishing importance in Southern New England. 62 p. Sterling (VA): U.S. Department of the Interior, Bureau of Ocean Energy Management. Report No.: OCS Study BOEM 2019-049.

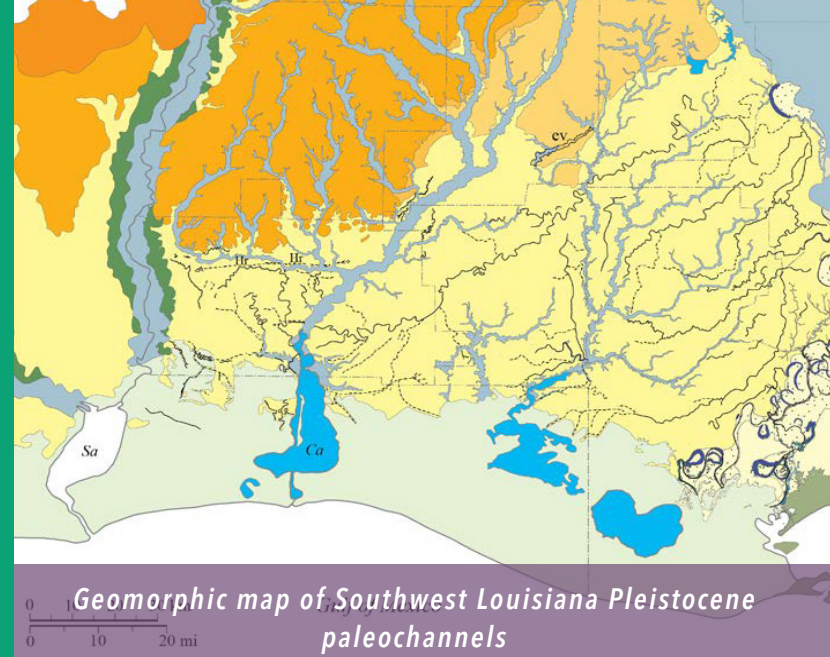
# Response of Later Quaternary Valley Systems to Holocene Sea Level Rise on the Continental Shelf Offshore Louisiana: Preservation Potential of Paleolandscapes

**ESPIS Link:** <https://marinecadastre.gov/espis/#/search/study/100244>

**Conducted by:** Louisiana State University

**National Studies List:** GM-09-01-10

**Study Products (available in ESPIS):** Final report, technical summary



## Purpose/Information Use:

Understanding the complex response of coastal landform morphology to sea level rise is important for evaluating the preservation potential of paleolandscapes (ancient landscapes) and identifying sand resources on the Outer Continental Shelf. This study provides a methodology for identifying and mapping paleosurfaces (a surface created by erosion that occurred thousands of years ago) that might contain significant cultural resources. The methodology can also be used for mapping potential sand resources that are needed for coastal restoration. BOEM will use the methodology to better manage conflicts between the preservation of prehistoric cultural resources and the extraction of mineral resources.

## Findings/Results:

- Preliminary generalizations can be made about where to find paleosurfaces that may be associated with preserved cultural resources.
- The important surface that is associated with preserved cultural resources is the Holocene-Pleistocene surface. The extent to which it is preserved and unmodified by relative sea level rise will be a major influence on the preservation potential of cultural resources.
- It is theoretically possible that periods of very rapid sea level rise might have preserved strips of the Holocene-Pleistocene surface and that these might contain cultural resources.

## Final Reports:

Heinrich PV, Miner M, Paulsell R, McCulloh RP. 2020. Response of Late Quaternary Valley systems to Holocene sea level rise on continental shelf offshore Louisiana: preservation potential of paleolandscapes. New Orleans (LA): U.S. Department of the Interior, Bureau of Ocean Energy Management. 104 p. Report No.: BOEM 2020-004.



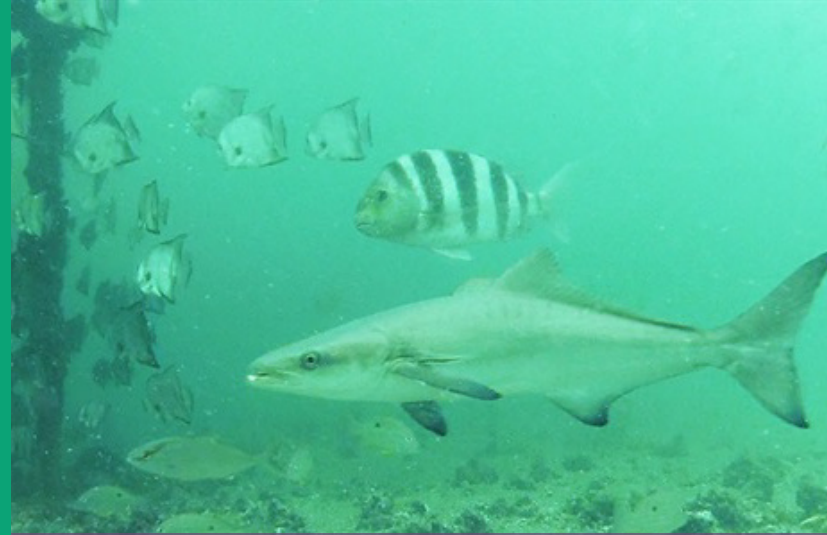
# Evaluating the Importance of Shallow Water Rigs as Habitat for Newly Recruited Reef Associated Fishes in the OCS Off Louisiana

**ESPIS Link:** <https://marinecadastre.gov/espis/#/search/study/100006>

**Conducted by:** Louisiana Universities Marine Consortium

**National Studies List:** GM-09-01-12

**Study Products (available in ESPIS):** Final report, technical summary



*Video frame of juvenile spadefish, lane snapper, greater amberjack, adult spadefish, yellow jack, cobia, and sheepshead around platform WC 148-1*

## Purpose/Information Use:

A distinctive feature of coastal Louisiana is the extensive network of oil and gas platforms extending from inshore waters to the deep Gulf of Mexico. Between 2007–2016, the number of platforms reduced by 38%, with the highest removal rates occurring in shallow (less than 60 feet) nearshore waters. Many fishes and invertebrates are found at platforms, which serve as artificial habitat. Previous studies of fishes around oil platforms focused on a few relatively large platforms in deeper waters. The primary goal of this project was to determine the degree to which these small shallow water structures serve as important recruitment sites and habitat for juvenile reef-associated fishes throughout the coastal zone adjacent to Louisiana. The results of the study will help BOEM better understand the impacts of the removal of shallow water platforms on fish productivity.

## Findings/Results:

- Small oil platforms located in the nearshore zone off Louisiana appear to be important habitat for fishes, especially juvenile reef-associated fishes such as young-of-the-year red and lane snapper, gray trigger fish, and gag grouper.
- Distribution and abundance of these fishes appear to be driven by the complex and diverse patterns of hydrography off Louisiana.
- Structures in the nearshore may be more important to platform-associated secondary production than platforms and other artificial reefs located in lower productivity areas of the coastal zone.

## Final Reports:

Chesney EJ, Munnely RT, Reeves DA, Baltz DM. 2019. Use of small shallow water oil and gas platforms as reef habitat for fishes and fouling biota. New Orleans (LA): U.S. Department of the Interior, Bureau of Ocean Energy Management, Gulf of Mexico OCS Region. 175 p. Report No: OCS Study BOEM 2019-077.

# Movement and Habitat Associations of Sea Turtles in the Northern Gulf of Mexico

**ESPIS Link:** <https://marinecadastre.gov/espis/#/search/study/100272>

**Conducted by:** National Oceanic and Atmospheric Administration

**National Studies List:** GM-10-04

**Study Products (available in ESPIS):** Final report, technical summary



*A satellite tagged loggerhead ready for release*

## Purpose/Information Use:

Energy exploration and extraction in the Gulf of Mexico (GOM) have been identified as potential threats to protected turtles. One significant factor limiting the ability to assess the impacts of human-induced threats to sea turtles is the lack of information on spatial distribution, habitat use, and abundance of loggerhead and Kemp's ridley sea turtles, both federally listed species under the Endangered Species Act. This study used satellite telemetry tagging to collect data on dive-surface behavior (particularly spatial and temporal changes in dive behavior), movement, and habitat use. BOEM will use the data derived from this study to inform spatial models and in-water abundance estimates of loggerhead and Kemp's ridley turtles in the GOM to further inform any impacts to these species from energy exploration and extraction activities.

## Findings/Results:

- The dive-surface behaviors for both loggerhead and Kemp's ridley turtles indicated important seasonal, diurnal (time of day), and spatial effects on the time spent at the surface.
- Loggerhead turtles moved into deeper waters and spent less time at the surface during cooler months.
- For Kemp's ridley turtles, the seasonal pattern was weaker than that observed in loggerhead turtles. The Kemp's ridley turtles tagged in this study had less variability in habitats and movement patterns, and therefore less variation in depth behaviors.

## Final Reports:

Garrison LP, Glenn III DW, Karrigan H. 2019. The movement and habitat associations of sea turtles in the Northern Gulf of Mexico. New Orleans (LA): U.S. Department of the Interior, Bureau of Ocean Energy Management. 69 p. Report No.: OCS Study BOEM 2020-010.



# Abundance and Distribution of Commercially Important Estuarine Dependent Species Populations Within the Gulf of Mexico

**ESPIS Link:** <https://marinecadastre.gov/espis/#/search/study/100039>

**Conducted by:** University of New Orleans

**National Studies List:** GM-12-x10

**Study Products (available in ESPIS):** Final report, technical summary, data



*Measuring aquatic environmental conditions in Lake Borgne, Louisiana, before sampling for fishes, crabs, and shrimp*

## Purpose/Information Use:

The Northern Gulf of Mexico has some of the most productive estuarine-based fisheries in the United States. Over the past two decades, however, the ecosystems in this region have experienced large-scale natural and anthropogenic disasters. To assess the status of the local aquatic organisms and habitats, this study analyzed fishery-independent data from trawl and beach seine collections completed over three decades (1986–1995, 1996–2005, and 2006–2015) during spring (April–June) and fall (September–November) from Southeastern Louisiana, the Mississippi Sound, and coastal Alabama. BOEM will use the results of the study to assess the population trends of estuarine-dependent fisheries species to support the stewardship and management of Outer Continental Shelf resources.

## Findings/Results:

- Species composition in trawl collections differed significantly among the three states for both spring and fall, while beach seine collections were not significantly different across the states for either the spring or fall.
- The greatest habitat factor contributing to these differences was the presence of more shell substrate at the Louisiana sites.
- While 32 species exhibited significant declines in at least one state-season-gear scenario (e.g., Louisiana-spring-trawl) over the three decades, blue crab and least puffer experienced the most declines overall. Four species of flatfishes also experienced multiple declines over the same period.
- Louisiana trawl sites became significantly more saline in both seasons over time; both Mississippi spring trawl sites and Alabama trawl sites became significantly warmer during the study period.

## Final Reports:

O'Connell MT, Peterson MS, Powers SP, Uzee-O'Connell AM, Hendon JR, Anderson EJ. 2019. Abundance and distribution of commercially important estuarine dependent species populations within the Gulf of Mexico. New Orleans (LA): U.S. Department of the Interior, Bureau of Ocean Energy Management. 59 p. Report No.: OCS Study BOEM 2019-037.

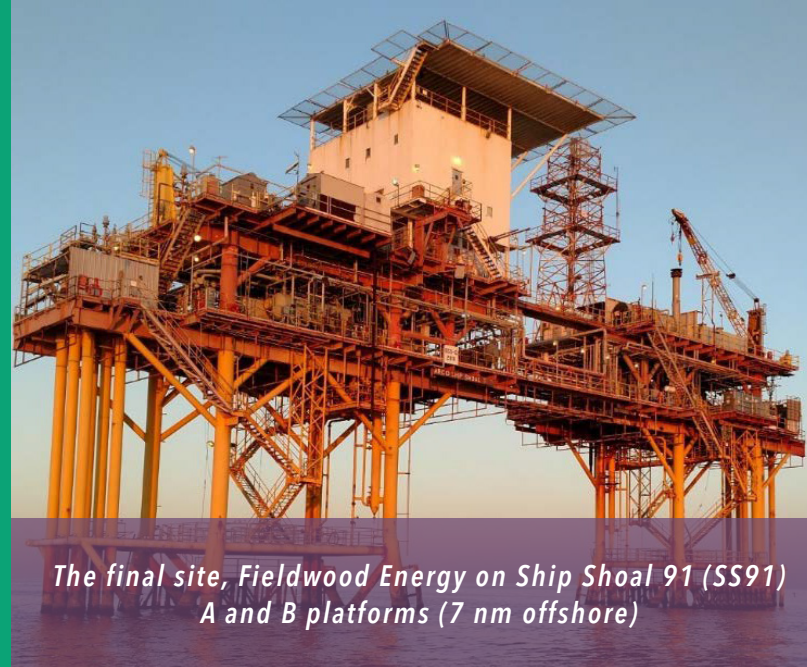
# A Critical Real-Time Louisiana Coastal Ocean Observing Station

**ESPIS Link:** <https://marinecadastre.gov/espis/#/search/study/100148>

**Conducted by:** Louisiana State University

**National Studies List:** GM-14-03-08

**Study Products (available in ESPIS):** Final report, technical summary



*The final site, Fieldwood Energy on Ship Shoal 91 (SS91) A and B platforms (7 nm offshore)*

## Purpose/Information Use:

One of the major challenges researchers face in the northern Gulf of Mexico coastal area is the need for a better and reliable offshore metocean (meteorology and physical oceanography) real-time data collection system. Due to a number of factors (e.g., severe weather, bio-fouling, metal corrosion, difficulty in access, and high costs), offshore real-time oceanographic stations are difficult to establish, operate, and maintain. The intent of this study was to establish a new real-time coastal observing station for the Gulf Coast Ocean Observing System (GCOOS) network. The new station was designed to be more economical to operate, more reliable, and equipped with better sensors, data loggers, and data transfer technology. The instrument will support the mission of BOEM and other Federal and local agencies engaged in coastal management, protection, and restoration, especially along the Louisiana coast. BOEM will use the gathered data to improve numerical model predictions of the oceanic conditions that affect the fate of sediments.

## Findings/Results:

- The instrument was successfully installed and tested. Real-time data for ocean current velocity profiles and water levels were recorded from August-December 2018. After some adjustments, data collection restarted in March 2019.
- Establishing a new real-time observation station on an existing oil and gas platform is challenging. Site selection needs to be considered carefully, coordination among stakeholders can take a long time, and the fact that all wires need to be explosion-proof adds a layer of complexity to equipment design.
- Once installed, the system should be easier and less costly to maintain than older systems.

## Final Reports:

Li C, Milan B, Huang W, Luo Y. 2020. A real-time observing station off Timbalier Bay, Louisiana. New Orleans (LA): U.S. Department of the Interior, Bureau of Ocean Energy Management. 74 p. Report No.: OCS Study BOEM 2020-015.



# Passive Acoustic Monitoring (PAM) Program for the Northern Gulf of Mexico; Task 1, Literature Review

**ESPIS Link:** <https://marinecadastre.gov/espis/#/search/study/100271>

**Conducted by:** HDR, Inc.

**National Studies List:** GM-15-02

**Study Products (available in ESPIS):** Final report, technical summary



*Internal view of a marine autonomous recording unit (MARU)*

## Purpose/Information Use:

This literature review was conducted under BOEM's Passive Acoustic Monitoring (PAM) Program for the northern Gulf of Mexico (GOM). The researchers searched and compiled readily available literature and data on prior and ongoing PAM projects in BOEM's three GOM planning areas (Eastern, Central, and Western). The search focused on gathering a variety of literature types on biological and physical ambient noise levels in the GOM. The review also focused on PAM projects for marine mammals in the GOM and on anthropogenic (human generated) sound sources in the region. The focus was on collecting information from the last 15 years of studies, although some research in the GOM from as far back as 1991 was included. The information collected will help BOEM design and implement a multi-year acoustic data collection and monitoring plan in the GOM to further define baseline soundscapes.

## Findings/Results:

- Since 1991, 32 projects have been conducted in the GOM using PAM. Eight of these were specifically designed to gather data on ambient noise; the other 24 were designed to gather information on marine mammals.
- The majority of the data collection efforts focused primarily on the Eastern and Central GOM Planning Areas. PAM surveys have tended to be in waters of the continental shelf and slope down to approximately 6,500 feet deep; only two surveys were in waters extending to approximately 10,500 feet deep.
- Based on the findings from the literature review, this study generated 14 recommendations to improve the design of the PAM Program in the northern GOM.

## Final Reports:

Latussek-Nabholz JN, Whitt AD, Fertl D, Gallien DR, Ampela K, Khan AA, Sidorovskaia N. 2020. Literature synthesis on passive acoustic monitoring projects and sound sources in the Gulf of Mexico. New Orleans (LA): U.S. Department of the Interior, Bureau of Ocean Energy Management. 99 p. Report No.: OCS Study BOEM 2020-009.

# Offshore Renewable Energy Feasibility Study Across Technology Types for the U.S. Gulf of Mexico

**ESPIS Link:** <https://marinecadastre.gov/espis/#/search/study/100186>

**Conducted by:** National Renewable Energy Laboratory

**National Studies List:** GM-17-09

**Study Products (available in ESPIS):** Final report, technical summary



*Block Island Wind Farm with jacket-type substructures (yellow)*

## Purpose/Information Use:

A variety of technologies currently exist or are under development for using marine resources to generate renewable energy in offshore waters. During the last 25 years, offshore wind has developed into a major part of the European energy sector. In the United States, BOEM has approved the first commercial-scale offshore wind construction and operation plan (Vineyard Wind, about 12 nautical miles offshore Martha's Vineyard and 12 nautical miles offshore Nantucket, MA), and the bureau continues to review multiple applications for additional projects. A host of other marine renewable energy technologies are in various stages of research, development, and testing, including wave, tidal, ocean currents, ocean-based solar, ocean thermal gradients, and deep water source cooling. This study summarizes the various types of offshore renewable energy technologies and assesses their technical, economic, and environmental feasibility in the Gulf of Mexico (GOM). The results of the study will inform BOEM's strategic planning regarding offshore wind development in the region.

## Findings/Results:

- Offshore wind has the highest potential to deliver utility-scale electricity from ocean-based renewable energy in the GOM, but its deployment and ability to serve a significant percentage of the load in the region depends on improving its economics over the next decade.
- When considering U.S. states with sites having average wind speeds greater than 15.7 mph and water depths less than 3,280 feet, three of the top four states with the highest offshore wind resource capacity (Louisiana, Texas, and Florida) are in the Gulf.
- A single 600-MW offshore wind project could support approximately 4,470 jobs and \$445 million in gross domestic product during construction, and 150 ongoing jobs and \$14 million annually from operations and maintenance labor, materials, and services.

## Final Reports:

Musial W, Tegen S, Driscoll R, Spitsen P, Roberts O, Kilcher L, Scott G, and Beiter P. 2019. Survey and assessment of the ocean renewable resources in the US Gulf of Mexico. New Orleans (LA): Bureau of Ocean Energy Management. 82 p. Report No.: OCS Study BOEM 2020-017.

Musial W, Beiter P, Stefek J, Scott G, Heimiller D, Stehly T, Tegen S, Roberts O, Greco T, Keyser D. 2020. Offshore wind in the US Gulf of Mexico: regional economic modeling and site-specific analyses. New Orleans (LA): Bureau of Ocean Energy Management. 94 p. Report No.: OCS Study BOEM 2020-018.



# Regional Essential Fish Habitat Geospatial Assessment and Framework of Offshore Sand Features

**ESPIS Link:** <https://marinecadastre.gov/espis/#/search/study/100184>

**Conducted by:** National Oceanic and Atmospheric Administration (NOAA), National Centers for Coastal Ocean Science

**National Studies List:** NT-16-09

**Study Products (available in ESPIS):** Final report (Vols. 1-4), technical summary, data, related publications



## Purpose/Information Use:

One of BOEM's responsibilities is to manage mineral resources on the Outer Continental Shelf (OCS). With increasing demand for sand for beach renourishment and barrier island restoration, BOEM expects to continue to receive more requests for OCS sand. Under the Magnuson-Stevens Act, NOAA's National Marine Fisheries Service (NMFS) is responsible for identification and protection of Essential Fish Habitat (EFH) of federally managed marine and anadromous (fish that migrate up rivers from the ocean to spawn) fishes. Prior to authorizing a project to remove sand or other sediment resources from the OCS, BOEM must first consult with NMFS to ensure that fishes and their habitats are not adversely affected by the project. This study focuses on the shallow waters of the Atlantic and Gulf of Mexico OCS. BOEM will use the outputs of the study in the EFH consultation process.

## Findings/Results:

- Volume 1 of the final report summarizes the international scientific knowledge on the direct effects of dredging on fish and their habitats and reviews the state-of-science on fish habitat associations.
- Volume 2 proposes a new schema for classifying OCS sand features for adoption under the Coastal and Marine Ecological Classification Standard.
- Volume 3 presents the scientific analysis and results of predictive modeling for select federally managed fish. Overall, species' distributions were primarily related to oceanographic conditions, nearby wetlands and estuaries, and prey species.
- Volume 4 outlines the process and framework used to develop the interactive mapping tool, user interface, and automated reporting of ShoalMATE (Shoal Map and Assessment Tool for EFH)—a standardized reporting tool to facilitate better communication between BOEM and NOAA during EFH consultations.

## Final Report (4 volumes):

Pickens, BA, Taylor JC, editors. Regional Essential Fish Habitat geospatial assessment and framework for offshore sand features. Sterling (VA): U.S. Department of the Interior, Bureau of Ocean Energy Management. Report No.: OCS Study BOEM 2020-002 and NOAA NCCOS Technical Memorandum 270.

# Evaluation of the Use of Chemical Dispersants in Oil Spill Response

**ESPIS Link:** <https://marinecadastre.gov/epis/#/search/study/100211>

**Conducted by:** National Academies of Sciences, Engineering, and Medicine

**National Studies List:** NT-16-x30

**Study Products (available in ESPIS):** Related publication



*Pacific Region oil & gas platform*

## Purpose/Information Use:

Whether the result of an oil well blowout, vessel collision or grounding, leaking pipeline, or other incident at sea, each marine oil spill presents unique circumstances and challenges. Many aspects of spills may vary significantly: oil type and properties, location, time of year, duration, water depth, environmental conditions, affected biomes, potential human community impact, and available response resources. Spill responders have used a variety of options—including mechanical recovery of oil using skimmers and booms, in situ burning of oil, monitored natural attenuation of oil, and dispersion of oil by chemical dispersants. Because each response method has advantages and disadvantages, it is important to understand the net benefit that may be achieved by using a particular tool or combination of tools in specific scenarios. This study builds on two previous National Research Council studies on dispersant use and provides BOEM and other Federal and state agencies with a current understanding of the state of science to inform future marine oil spill response operations.

## Findings/Results:

- The study presents 38 findings and 45 recommendations that address the following: fate and transport of chemical dispersants and oil; aquatic toxicology and biological effects of dispersants and oil; considerations for human health; and tools and response options available for decision makers.

## Final Report:

National Academies of Sciences, Engineering, and Medicine. 2020. The use of dispersants in marine oil spill response. Washington (DC): The National Academies Press. 340 p.



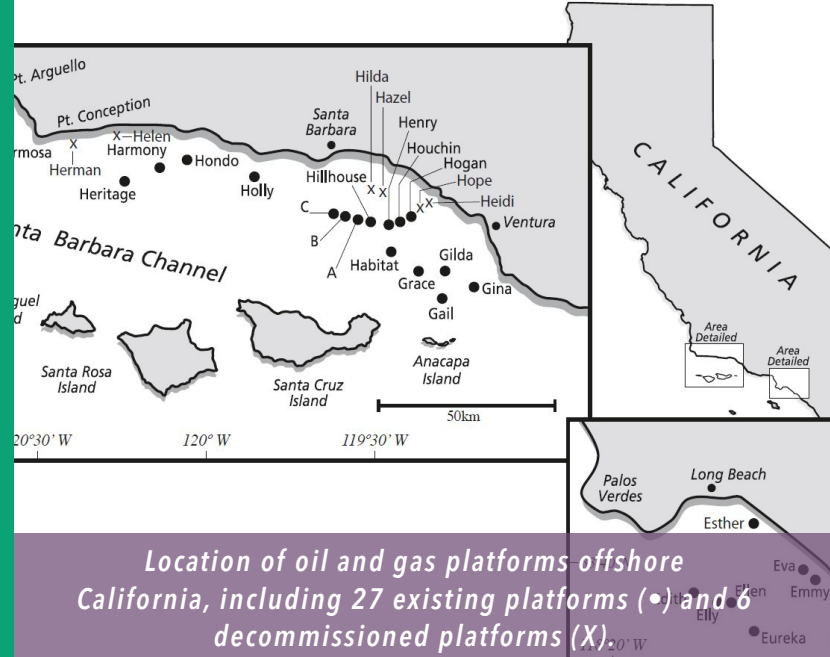
# Synthesis of Pacific Platform Research

**ESPIS Link:** <https://marinecadastre.gov/espis/#/search/study/100091>

**Conducted by:** University of California Santa Barbara

**National Studies List:** PC-15-03

**Study Products (available in ESPIS):** Final report, technical summary, web-based annotated bibliography, related publications



## Purpose/Information Use:

With the construction of the first oil and gas platforms offshore California in 1958, the ecology and assemblages of organisms living in association with these platforms have been of continuing interest. This study synthesized reports and peer-reviewed literature on the substantial body of research conducted about oil and gas platforms and natural reefs offshore southern California. The goals of the study were to increase scientific understanding of the relationships of fish and invertebrate populations at platforms and reefs in the Southern California Bight, and determine the extent of influence of platform assemblages on southern California and the Pacific coast populations. The synthesized information will inform BOEM's evaluation of potential environmental effects of platform removal and assist BOEM and the Bureau of Safety and Environmental Enforcement (BSEE) in decision-making about decommissioning.

## Findings/Results:

- The study summarized 182 papers and reports about California platform research in these subsections: Biology and Ecology of California Platform Organisms, Environmental Effects of Offshore Oil Development, and Potential Consequences of Platform Decommissioning.
- Researchers constructed a queryable, web-based, annotated bibliography encompassing research on oil and gas platforms conducted throughout the world—available at <http://platformresearch.msi.ucsb.edu>
- Fish and invertebrate assemblages around California platforms were compared with those associated with Gulf of Mexico platforms.
- In addition to a final report synthesizing the research, this study also contributed to a dedicated issue of the Bulletin of Marine Science containing 11 papers.

## Final Report:

Love MS. 2019. An overview of ecological research associated with oil and gas platforms offshore California. Camarillo (CA): U.S. Department of the Interior, Bureau of Ocean Energy Management. 148 p. Report No.: OCS Study BOEM 2019-052.



## The Department of the Interior Mission

The Department of the Interior protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities.

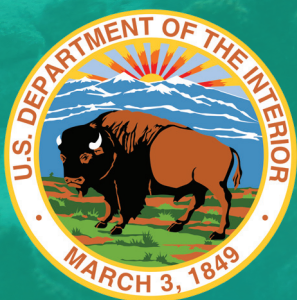
## The Bureau of Ocean Energy Management

The mission of the Bureau of Ocean Energy Management is to manage development of U.S. Outer Continental Shelf energy and mineral resources in an environmentally and economically responsible way.

## The BOEM Environmental Studies Program

The mission of the Environmental Studies Program (ESP) is to provide the information needed to predict, assess, and manage impacts from offshore energy and marine mineral exploration, development, and production activities on human, marine, and coastal environments. The proposal, selection, research, review, collaboration, production, and dissemination of each of BOEM's Environmental Studies follows the DOI Code of Scientific and Scholarly Conduct, in support of a culture of scientific and professional integrity, as set out in the DOI Departmental Manual (305 DM 3).

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